



NEX Gas Station Site Update, DoDHF Novato, California

March 2001

SITE HISTORY

Department of Defense Housing Facility (DoDHF) Novato is located on former Hamilton Air Force Base (AFB) property in Novato, CA. The AFB was in use by the Air Force prior to being transferred to the Army, the Navy, and the Coast Guard. Most of the AFB was used by the Army Air Corps and was designated Hamilton Army Airfield. The Navy took over many of the housing units on the Base and established DoDHF Novato. The Navy-occupied portion also included various operations to support the housing facility, including a Naval Exchange (NEX) gas station and Public Works Center (PWC) gas station (Figure 1) that were in use from the

mid-1970s to the early 1990s. At that time, the gas stations were closed and the underground storage tanks (USTs) that had previously stored gasoline were removed. The site is now designated Former UST Site 957/970 because buildings near the PWC and NEX gas stations were identified as 957 and 970, respectively.

LAND USE

DoDHF Novato is scheduled for transfer of ownership under the Base Realignment and Closure (BRAC) program. A portion of the site encompasses the former NEX gas station and Building 970. This area, referred to as the Sale Area, is to be sold to the City of Novato, CA for commercial/industrial use. Other portions of the site are to be transferred to the Novato Unified School District (NUSD) as an educational public benefit conveyance (PBC). One parcel, located on former Hamilton Army Airfield property, was sold by the Army; Shea Homes, the current owner, is constructing the Hamilton Meadows residential subdivision on this parcel.

SOIL AND GROUNDWATER

Prior to removal of USTs from Former UST Site 957/970, gasoline releases impacted soils near some of the tanks and reached the groundwater in the shallow aquifer. Benzene, toluene, ethylbenzene, and xylenes (BTEX) are typical organic compounds in gasoline that have been detected in groundwater at the site. BTEX compounds in groundwater are limited to the Navy property, and three years of quarterly groundwater monitoring have shown that these gasoline constituents are stable and that concentrations are decreasing over time (Figure 2). The extent of dissolved benzene in groundwater is shown in Figure 1.

Methyl-*tert*-butyl ether (MTBE), a gasoline oxygenate additive, also has been detected in groundwater at the site. MTBE has been added to gasoline since the late 1970s and is a common constituent of Reformulated Gasoline (RFG) and California's Cleaner Burning Gasoline. MTBE in groundwater

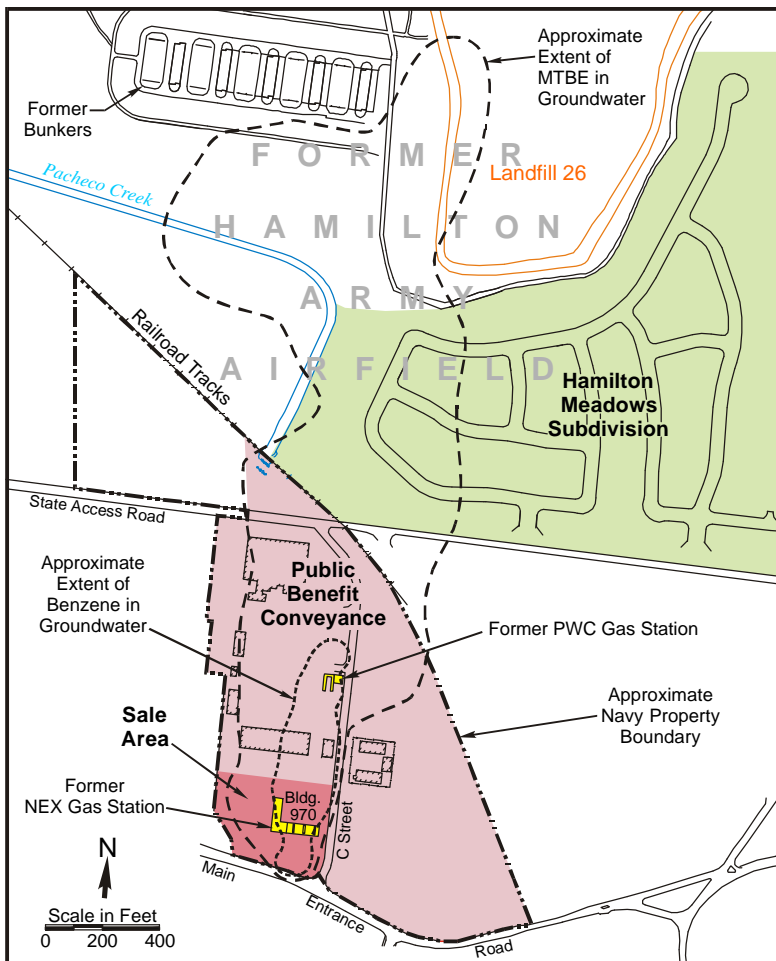


FIGURE 1. Site Map

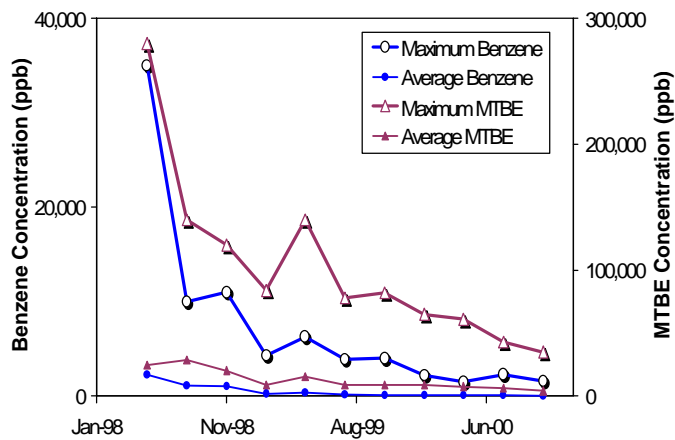


FIGURE 2. Reduction in Maximum and Average Benzene and MTBE Concentrations Over Time. Maximum and average benzene and MTBE concentrations in groundwater have decreased since quarterly groundwater monitoring began in May 1998.

originates from the former NEX gas station, and decreasing concentrations are observed as the plume extends north to the row of former bunkers west of Landfill 26 (Figure 1).

SITE REMEDIATION

The Navy performed an Interim Remedial Action to reduce gasoline concentrations in soil and groundwater at Former UST Site 957/970 while site investigations and risk assessment activities were being performed. An

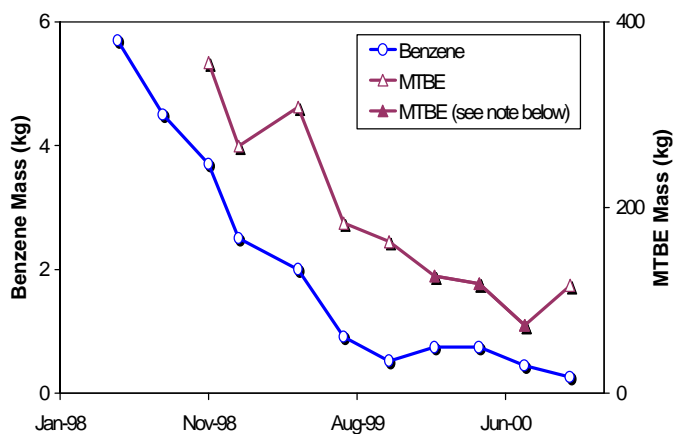


FIGURE 3. Reduction in Dissolved Mass Over Time. Ever since the onset of remediation, the estimated mass of MTBE and benzene dissolved in groundwater has shown a consistent decrease. Dissolved MTBE in groundwater was reduced from 356 kg in November 1998 to 116 kg in November 2000. Similarly, the mass of benzene dissolved in groundwater was reduced from 5.7 kg to 0.26 kg from May 1998 to November 2000. NOTE: Construction activities prevented sampling of the entire well network; therefore, MTBE mass appears lower during these events.

approach known as in situ air sparging with soil vapor extraction (IAS/SVE) was used to clean the water and soil; this approach involves injecting compressed air below the water table and removing the resulting vapors from the soil. The IAS/SVE system was operated at the site from June 1998 to October 1999, and approximately 23,000 lb of gasoline were removed from groundwater and soil underlying the site. These activities also resulted in reduced benzene and MTBE concentrations, as shown in Figure 2. Similarly, IAS/SVE system operations resulted in significant reduction of benzene and MTBE masses, as shown on Figure 3. Operation of the IAS/SVE system was discontinued when removal rates dropped drastically, indicating that the areas around the system wells were remediated, as shown on Figure 4.

SURFACE WATER MONITORING

A small surface water stream (Pacheco Creek) overlies a portion of the site (see Figure 1). This stream flows into Ignacio Reservoir (i.e., Pacheco Pond), which is about a half mile north of the current edge of the MTBE plume. Although the creek may interact with the aquifer at least sometimes during the year, surface water concentrations are well below the MTBE interim water quality objective of 66 mg/L recommended in 1998 by the California Regional Water Quality Control Board for the protection of freshwater organisms. Results of quarterly surface water monitoring performed by the Navy at multiple locations indicate that maximum MTBE concentrations range from 0.15 to 2.4 mg/L. MTBE concentrations at the furthest downstream monitoring point, located approximately 2,000 ft upstream of Pacheco Pond, are near or below the detection limit of 0.0005 mg/L.

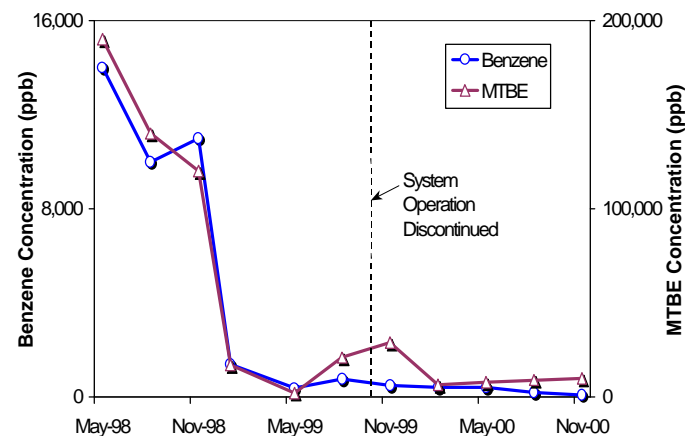


FIGURE 4. Source Area Benzene and MTBE Concentrations. Navy remediation activities resulted in a significant reduction in benzene and MTBE concentrations in groundwater over the first year of system operation. As demonstrated by monitoring well MW-1A, located near the former location of USTs at the NEX gas station, benzene and MTBE concentrations remained low after system operation was discontinued in October 1999.

RISK ASSESSMENT

A risk assessment for the site was prepared in accordance with U.S. EPA and California Department of Toxic Substances Control (DTSC) guidance. The risk assessment incorporated extensive, site-specific data collected by the Navy (a summary of results follows).

The public benefit conveyance (PBC) Area (Figure 1) was evaluated using a residential use scenario, which is the most conservative scenario. The total risk is below the U.S. EPA and DTSC allowable risk of one excess cancer in a million, indicating that the PBC Area is suitable for future unrestricted use as a school or residential development.

The Sale Area (Figure 1) was evaluated for commercial/industrial use, which complies with the planned future use. The total risk falls between the U.S. EPA and DTSC acceptable commercial development risk level of one excess cancer in one hundred thousand and the school/residential risk level of one in a million; thus the area is suitable for commercial development.

Potential risk associated with both the PBC Area and the Sale Area is associated primarily with the volatilization of gasoline constituents in groundwater and/or soil to indoor air. Indoor air risk was calculated by using data provided from soil-gas sampling performed by the Navy over the entire site. In fall 2000, soil-gas measurements were made at 14 locations, eight directly overlying dissolved gasoline constituents in groundwater and six along the periphery. The six periphery samples were collected to confirm that no off-site transport of vapors was occurring. Of the eight soil-gas measurements performed at locations overlying dissolved gasoline constituents in groundwater, two were situated north of State Access Road near Hamilton Meadows Subdivision where only MTBE is found in groundwater. At these two locations, some BTEX compounds and MTBE were measured in the soil-gas; however, the concentrations were less than those used to calculate indoor air risk in the PBC Area. Therefore, potential indoor air risks in areas overlying groundwater with dissolved MTBE near Hamilton Meadows Subdivision are less than those in the PBC Area, and because the PBC Area is suitable for residential land use, so are the areas near Hamilton Meadows Subdivision. This recent information substanti-

NAVY ACTIONS

The Navy has performed substantial site characterization, remediation, and risk assessment activities in response to the gasoline releases at Former UST Site 957/970 to ensure that neither the environment nor the community is impacted further. Some of the activities include the following:

- ❑ Removal of USTs and other subsurface features
- ❑ Site characterization activities
- ❑ Interim remedial action for groundwater and soil
- ❑ Investigation to confirm effectiveness of remedial action
- ❑ Installation of more than 70 wells for remediation and monitoring purposes
- ❑ Ongoing quarterly groundwater monitoring (since March 1998)
- ❑ Ongoing surface water monitoring (since June 2000)
- ❑ Extensive soil-gas and ambient air monitoring
- ❑ Human health risk assessment
- ❑ Ecological risk assessment
- ❑ Routine meetings with relevant parties to provide information and address concerns.

ates the findings in the previous risk assessment of 1999.

In addition to soil-gas sampling, direct air sampling was performed by the Navy to assess on-site concentrations of indoor and outdoor air relative to concentrations in off-site areas. Results, detailed in Figure 5, indicate that concentrations on site were less than concentrations at the off-site, downtown San Rafael monitoring station.

FUTURE ACTIVITIES

In July 2000, the RWQCB issued Order No. 00-064, which identified cleanup requirements for Former UST Site 957/970. The Navy has complied with tasks set forth in the order and will continue to work to fulfill the

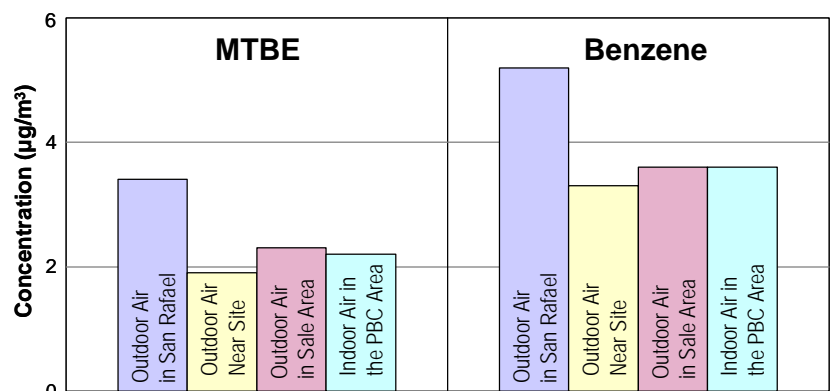


FIGURE 5. Ambient Air Sampling Results. The Navy has conducted direct air sampling at indoor and outdoor locations directly overlying the plume, at a background location near the site, and at a Bay Area Air Quality Management District monitoring station in San Rafael. Air sampling results indicate that the air over the site contains about half the concentrations of benzene and MTBE as the air at the San Rafael sampling location does. Results indicate that indoor air concentrations are similar to outdoor air concentrations in areas overlying the gasoline-impacted groundwater. Furthermore, outdoor air concentrations in samples collected over the gasoline-impacted groundwater were similar to outdoor air concentrations at background location not overlying impacted groundwater.

remaining requirements in a timely and thorough manner in cooperation with the RWQCB. One of the remaining requirements is the preparation of a Corrective Action Plan (CAP), which will evaluate remedial actions, and present the recommended actions to protect human health and the environment. The CAP will be available for public review during summer 2001. Ground-water and surface water monitoring will continue.

DOCUMENT REPOSITORY

Site documents can be found in the reference section at the South Novato Public Library for review.

South Novato Public Library
476 Ignacio Blvd.
Novato, CA 94949

Tuesday/Thursday, 1:00 P.M.-8:00 P.M.
Wednesday/Saturday 10:00 A.M.-4:00 P.M.

(Cut out and return.)

Department of Defense Housing Facility Novato Future Mailing Request

Yes, please send me future fact sheets related to the NEX Gas Station Site at DoD Housing Facility, Novato.

Name _____

Address _____
Street, Apt. # City State/ZIP

Phone () _____ () _____ E-Mail _____
Daytime / Evening Fax

Please return to Thomas L. Macchiarella at the address shown below.

CONTACT PERSON

If you have any additional questions or concerns related to Former UST 957/970, please contact:

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